



Appl. No. 09/974,973
Amdt. Dated August 22, 2003
Reply to Office Action of April 22, 2003
Replacement Sheet

1 GTGACTGCTATCACCTTGGCGGTCTCTTGTTGAAAGGAATAATTACTCTAGTGTCTGACT
.....+.....+.....+.....+.....+.....+.....+ 60

M T A I T L G G L L L K G I I T L V S T

61 CACACATCTTCAACGCTTCCAGCATTCAAAAAGATCTTGGTAGCAAACCGCGGCGAAATC
.....+.....+.....+.....+.....+.....+.....+ 120

H T S S T L P A F K K I L V A N R G E I

121 GCGGTCCGTGCTTTCCGTGCAGCACTCGAAACCGGTGCAGCCACGGTAGCTATTTACCCC
.....+.....+.....+.....+.....+.....+.....+ 180

A V R A F R A A L E T G A A T V A I Y P

181 CGTGAAGATCGGGGATCATTCCACCGCTCTTTTGCTTCTGAAGCTGTCCGCATTGGTACT
.....+.....+.....+.....+.....+.....+.....+ 240

R E D R G S G H R S F A S E A V R I G T

241 GAAGGCTCACCAGTCAAGGCGTACCTGGACATCGATGAAATTATCGGTGCAGCTAAAAAA
.....+.....+.....+.....+.....+.....+.....+ 300

E G S P V K A Y L D I D E I I G A A K K

301 GTTAAAGCAGATGCTATTTACCCGGGATATGGCTTCCTGTCTGAAAATGCCAGCTTGCC
.....+.....+.....+.....+.....+.....+.....+ 360

V K A D A I Y P G Y G F L S E N A Q L A

361 CGCGAGTGCGCGGAAAACGGCATTACTTTTATTGGCCCAACCCAGAGGTTCTTGATCTC
.....+.....+.....+.....+.....+.....+.....+ 420

R E C A E N G I T F I G P T P E V L D L

421 ACCGGTGATAAGTCTCGTGCGGTAACCGCCGCGAAGAAGGCTGGTCTGCCAGTTTTGGCG
.....+.....+.....+.....+.....+.....+.....+ 480

T G D K S R A V T A A K K A G L P V L A

481 GAATCCACCCCGAGCAAAAACATCGATGACATCGTTAAAAGCGCTGAAGGCCAGACTTAC
.....+.....+.....+.....+.....+.....+.....+ 540

E S T P S K N I D D I V K S A E G Q T Y

FIG.1A



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CCCATCTTTGTAAAGGCAGTTGCCGGTGGTGGCGGACGCGGTATGCGCTTTGTTTCTTCA
541+.....+.....+.....+.....+.....+.....+ 600

P I F V K A V A G G G G R G M R F V S S

CCTGATGAGCTCCGCAAATTGGCAACAGAAGCATCTCGTGAAGCTGAAGCGGCATTCCGGC
601+.....+.....+.....+.....+.....+.....+ 660

P D E L R K L A T E A S R E A E A A F G

GACGGTTCGGTATATGTGCAACGTGCTGTGATTAACCCCCAGCACATTGAAGTGCAGATC
661+.....+.....+.....+.....+.....+.....+ 720

D G S V Y V E R A V I N P Q H I E V Q I

CTTGGCGATCGCACTGGAGAAGTTGTACACCTTTATGAACGTGACTGCTCACTGCAGCGT
721+.....+.....+.....+.....+.....+.....+ 780

L G D R T G E V V H L Y E R D C S L Q R

CGTCACCAAAAAGTTGTCGAAATTGCGCCAGCACAGCATTTGGATCCAGAACTGCGTGAT
781+.....+.....+.....+.....+.....+.....+ 840

R H Q K V V E I A P A Q H L D P E L R D

CGCATTTGTGCGGATGCAGTAAAGTTCTGCCGCTCCATTGGTTACCAGGGCGCGGGAACC
841+.....+.....+.....+.....+.....+.....+ 900

R I C A D A V K F C R S I G Y Q G A G T

GTGGAATTCTTGGTCGATGAAAAGGGCAACCACGTTTTTCATCGAAATGAACCCACGTATC
901+.....+.....+.....+.....+.....+.....+ 960

V E F L V D E K G N H V F I E M N P R I

CAGGTTGAGCACACCGTGACTGAAGAAGTCACCGAGGTGGACCTGGTGAAGGCGCAGATG
961+.....+.....+.....+.....+.....+.....+ 1020

Q V E H T V T E E V T E V D L V K A Q M

CGCTTGGCTGCTGGTGCAACCTTGAAGGAATTGGGTCTGACCCAAGATAAGATCAAGACC
1021+.....+.....+.....+.....+.....+.....+ 1080

R L A A G A T L K E L G L T Q D K I K T

FIG.1B



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1081 CACGGTGCAGCACTGCAGTGCCGCATCACCACGGAAGATCCAAACAACGGCTTCCGCCCA
-----+-----+-----+-----+-----+-----+ 1140
H G A A L Q C R I T T E D P N N G F R P
1141 GATACCGGAACATCACCAGCTACCGCTCACCAGGCGGAGCTGGCGTTCGTCTTGACGGT
-----+-----+-----+-----+-----+-----+ 1200
D T G T I T A Y R S P G G A G V R L D G
1201 GCAGCTCAGCTCGGTGGCGAAATCACCACACACTTTGACTCCATGCTGGTGAAAATGACC
-----+-----+-----+-----+-----+-----+ 1260
A A Q L G G E I T A H F D S M L V K M T
1261 TGCCGTGGTTCGACTTTGAAACTGCTGTTGCTCGTGACAGCGCGGTTGGCTGAGTTC
-----+-----+-----+-----+-----+-----+ 1320
C R G S D F E T A V A R A Q R A L A E F
1321 ACCGTGTCTGGTGTGCAACCAACATTGGTTTCTTGCGTGCGTTGCTGCGGGAAGAGGAC
-----+-----+-----+-----+-----+-----+ 1380
T V S G V A T N I G F L R A L L R E E D
1381 TTCACTTCCAAGCGCATCGCCACCGGATTTATCGGCGATCACCCACACCTCCTTCAGGCT
-----+-----+-----+-----+-----+-----+ 1440
F T S K R I A T G F I G D H P H L L Q A
1441 CCACCTGCGGATGATGAGCAGGGACGCATCCTGGATTACTTGGCAGATGTCACCGTGAAC
-----+-----+-----+-----+-----+-----+ 1500
P P A D D E Q G R I L D Y L A D V T V N
1501 AAGCCTCATGGTGTGCGTCCAAAGGATGTTGCAGCACCAATCGATAAGCTGCCCAACATC
-----+-----+-----+-----+-----+-----+ 1560
K P H G V R P K D V A A P I D K L P N I
1561 AAGGATCTGCCACTGCCACGCGGTTCCCGTGACCGCCTGAAGCAGCTTGGCCCAGCCGCG
-----+-----+-----+-----+-----+-----+ 1620
K D L P L P R G S R D R L K Q L G P A A

FIG. 1C



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TTTGCTCGTGATCTCCGTGAGCAGGACGCACTGGCAGTTACTGATACCACCTTCCGCGAT
1621+.....+.....+.....+.....+.....+ 1680

F A R D L R E Q D A L A V T D T T F R D

GCACACCAGTCTTTGCTTGCGACCCGAGTCCGCTCATTGCACTGAAGCCTGCGGCAGAG
1681+.....+.....+.....+.....+.....+ 1740

A H Q S L L A T R V R S F A L K P A A E

GCCGTGCGAAAGCTGACTCCTGAGCTTTTGTCCGTGGAGGCCTGGGGCGGCGGACCTAC
1741+.....+.....+.....+.....+.....+ 1800

A V A K L T P E L L S V E A W G G A T Y

GATGTGGCGATGCGTTTCCTCTTTGAGGATCCGTGGGACAGGCTCGACGAGCTGCGCGAG
1801+.....+.....+.....+.....+.....+ 1860

D V A M R F L F E D P W D R L D E L R E

GCGATGCCGAATGTAAACATTCAGATGCTGCTTCGCGGCCGCAACACCGTGGGATACACC
1861+.....+.....+.....+.....+.....+ 1920

A M P N V N I Q M L L R G R N T V G Y T

CCGTACCCAGACTCCGTCTGCCGCGCGTTTGTAAAGGAAGCTGCCAGCTCCGGCGTGGAC
1921+.....+.....+.....+.....+.....+ 1980

P Y P D S V C R A F V K E A A S S G V D

ATCTTCCGCATCTTCGACGCGCTTAACGACGTCTCCAGATGCGTCCAGCAATCGACGCA
1981+.....+.....+.....+.....+.....+ 2040

I F R I F D A L N D V S Q M R P A I D A

GTCCTGGAGACCAACACCGCGGTAGCCGAGGTGGCTATGGCTTATTCTGGTGATCTCTCT
2041+.....+.....+.....+.....+.....+ 2100

V L E T N T A V A E V A M A Y S G D L S

GATCCAAATGAAAAGCTCTACACCCTGGATTACTACCTAAAGATGGCAGAGGAGATCGTC
2101+.....+.....+.....+.....+.....+ 2160

D P N E K L Y T L D Y Y L K M A E E I V

FIG.1D



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2161 AAGTCTGGCGCTCACATTCTGGCCATTAAGGATATGGCTGGTCTGCTTCGCCCAGCTGCG
-----+-----+-----+-----+-----+-----+ 2220
K S G A H I L A I K D M A G L L R P A A
2221 GTAACCAAGCTGGTCACCGCACTGCGCCGTGAATTCGATCTGCCAGTGACGTGCACACC
-----+-----+-----+-----+-----+-----+ 2280
V T K L V T A L R R E F D L P V H V H T
2281 CACGACACTGCGGGTGGCCAGTTGGCTACCTACTTTGCTGCAGCTCAAGCTGGTGCAGAT
-----+-----+-----+-----+-----+-----+ 2340
H D T A G G Q L A T Y F A A A Q A G A D
2341 GCTGTTGACGGTGCTTCCGCACCACTGTCTGGCACCACCTCCCAGCCATCCCTGTCTGCC
-----+-----+-----+-----+-----+-----+ 2400
A V D G A S A P L S G T T S Q P S L S A
2401 ATTGTTGCTGCATTCGCGCACACCCGTGCGGATACCGGTTTGAGCCTCGAGGCTGTTTCT
-----+-----+-----+-----+-----+-----+ 2460
I V A A F A H T R R D T G L S L E A V S
2461 GACCTCGAGCCGTACTGGGAAGCTGTGCGCGGACTGTACCTGCCATTTGAGTCTGGAACC
-----+-----+-----+-----+-----+-----+ 2520
D L E P Y W E A V R G L Y L P F E S G T
2521 CCAGGCCCAACCGGTGCGGTCTACCGCCACGAAATCCCAGGCGGACAGTTGTCCAACCTG
-----+-----+-----+-----+-----+-----+ 2580
P G P T G R V Y R H E I P G G Q L S N L
2581 CGTGACAGGCCACCGCACTGGGCCTTGCTGATCGCTTCGAGCTCATCGAAGACAACCTAC
-----+-----+-----+-----+-----+-----+ 2640
R A Q A T A L G L A D R F E L I E D N Y
2641 GCAGCCGTTAATGAGATGCTGGGACGCCCAACCAAGGTCACCCCATCCTCCAAGGTTGTT
-----+-----+-----+-----+-----+-----+ 2700
A A V N E M L G R P T K V T P S S K V V

FIG.1E



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GGCGACCTCGCACTCCACCTGGTTGGTGCGGGTGTAGATCCAGCAGACTTTGCTGCAGAC
2701+.....+.....+.....+.....+.....+.....+ 2760

G D L A L H L V G A G V D P A D F A A D

CCACAAAAGTACGACATCCCAGACTCTGTCATCGCGTTCCTGCGCGGCGAGCTTGGAAC
2761+.....+.....+.....+.....+.....+.....+ 2820

P Q K Y D I P D S V I A F L R G E L G N

CCTCCAGGTGGCTGGCCAGAACCACTGCGCACCCGCGCACTGGAAGGCCGCTCCGAAGGC
2821+.....+.....+.....+.....+.....+.....+ 2880

P P G G W P E P L R T R A L E G R S E G

AAGGCACCTCTGACGGAAGTTCCTGAGGAAGAGCAGGCGCACCTCGACGCTGATGATTCC
2881+.....+.....+.....+.....+.....+.....+ 2940

K A P L T E V P E E E A A H L D A D D S

AAGGAACGTCGCAACAGCCTCAACCGCCTGCTGTTCCCGAAGCCAACCGAAGAGTTCCTC
2941+.....+.....+.....+.....+.....+.....+ 3000

K E R R N S L N R L L F P K P T E E F L

GAGCACCGTCGCCGCTTCGGCAACACCTCTGCGCTGGATGATCGTGAATTCTTCTACGGA
3001+.....+.....+.....+.....+.....+.....+ 3060

E H R R R F G N T S A L D D R E F F Y G

CTGGTCGAGGGCCGCGAGACTTTGATCCGCCTGCCAGATGTGCGCACCCCACTGCTTGTT
3061+.....+.....+.....+.....+.....+.....+ 3120

L V E G R E T L I R L P K V R T P L L V

CGCCTGGATGCGATCTCTGAGCCAGACGATAAGGGTATGCGCAATGTTGTGGCCAACGTC
3121+.....+.....+.....+.....+.....+.....+ 3180

R L D A I S E P D D K G M R N V V A N V

AACGGCCAGATCCGCCCAATGCGTGTGCGTGACCGCTCCGTTGAGTCTGTCACCGCAACC
3181+.....+.....+.....+.....+.....+.....+ 3240

N G Q I R P M R V R D R S V E S V T A T

FIG.1F



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GCAGAAAAGGCAGATTCTCCAACAAGGGCCATGTTGCTGCACCATTGCTGGTGTTGTC
3241+.....+.....+.....+.....+.....+.....+ 3300

A E K A D S S N K G H V A A P F A G V V

ACTGTGACTGTTGCTGAAGGTGATGAGGTCAAGGCTGGAGATGCAGTCGCAATCATCGAG
3301+.....+.....+.....+.....+.....+.....+ 3360

T V T V A E G D E V K A G D A V A I I E

GCTATGAAGATGGAAGCAACAATCACTGCTTCTGTTGACGGCAAGATTGAACGCGTTGTG
3361+.....+.....+.....+.....+.....+.....+ 3300

A M K M E A T I T A S V D G K I E R V V
GTTCTGCTGCAACGAAGGTGGAAGGTGGCGACTTGATCGTCGTCGTTTCCTAA
3421+.....+.....+.....+.....+.....+.....+ 3474

V P A A T K V E G G D L I V V V S *

FIG.1G



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	1	50
ATCC 21253 pyc	MST HTSSTLPAFK KILVANRGEI AVRAFRAALE	
NRRL B-11474 pyc	MTAITLGGLL LKGIITLV	
	51	100
ATCC 21253 pyc	TGAATVAIYP REDRGSFHRS FASEAVRIGT EGSPVKAYLD IDEIIGAACK	
NRRL B-11474 pyc		
	101	150
ATCC 21253 pyc	VKADAIYPGY GFLSENAQLA RECAENGITF IGPTPEVLDL TGDKSRAVTA	
NRRL B-11474 pyc		
	151	200
ATCC 21253 psy	AKKAGLPVLA ESTPSKNIDE IVKSAEQTY PIFVKAVAGG GGRGMRFVAS	
NRRL B-11474 pyc	D	S
	201	250
ATCC 21253 psy	PDELRKLATE ASREAEEAFG DGAVYVERAV INPQHIEVQI LGDHTGEVVH	
NRRL B-11474 pyc	S	R
	251	300
ATCC 21253 psy	LYERDCSLQR RHQKVVEIAP AQHLDPELRD RICADAVKFC RSIGYQGAGT	
NRRL B-11474 pyc		
	301	350
ATCC 21253 psy	VEFLVDEKGN HVFIEMNPRI QVEHTVTEEV TEVDLVKAQM RLAAGATLKE	
NRRL B-11474 pyc		
	351	400
ATCC 21253 psy	LGLTQDKIKT HGAALQCRIE TEDPNNGFRP DTGTITAYRS PGGAGVRLDG	
NRRL B-11474 pyc		
	401	450
ATCC 21253 psy	AAQLGGEITA HFDSMLVKMT CRGSDFETAV ARAQRALAEF TVSGVATNIG	
NRRL B-11474 pyc		
	451	500
ATCC 21253 psy	FLRALLREED FTSKRIATGF IADHPHLLQA PPADDEQGRI LDYLADVTVN	
NRRL B-11474 pyc	G	
	501	550
ATCC 21253 psy	KPHGVRPKDV AAPIDKLPNI KDLPLPRGSR DRLKQLGPAA FARDLREQDA	
NRRL B-11474 pyc		

FIG.2A



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ATCC 21253 psy	551	600
NRRL B-11474 pyc	LAVTDTTFRD AHQSLLATRV RSFALKPAAE AVAKLTPELL SVEAWGGATY	
ATCC 21253 psy	601	650
NRRL B-11474 pyc	DVAMRFLFED PWDRLDELRE AMPNVNIQML LRGRNTVGYT PYPDSVCRAF	
ATCC 21253 psy	651	700
NRRL B-11474 pyc	VKEAASSGVD IFRIFDALND VSQMRPAIDA VLETNTAVAE VAMAYSGDLS	
ATCC 21253 psy	701	750
NRRL B-11474 pyc	DPNEKLYTLD YYLKMAEEIV KSGAHILAIK DMAGLLRPAA VTKLVTALRR	
ATCC 21253 psy	751	800
NRRL B-11474 pyc	EFDLPVHVHT HDTAGGQLAT YFAAAQAGAD AVDGASAPLS GTTSQPSLSA	
ATCC 21253 psy	801	850
NRRL B-11474 pyc	IVAFAHTRR DTGLSLEAVS DLEPYWEAVR GLYLPFESGT PGPTGRVYRH	
ATCC 21253 psy	851	900
NRRL B-11474 pyc	EIPGGQLSNL RAQATALGLA DRFELIEDNY AAVNEMLGRP TKVTPSSKVV	
ATCC 21253 psy	901	950
NRRL B-11474 pyc	GDLALHLVGA GVDPAFDAAD PQKYDIPDSV IAFLRGELGN PPGGWPEPLR	
ATCC 21253 psy	951	1000
NRRL B-11474 pyc	TRALEGRSEG KAPLTEVP EEQAHL DADDS KERRNSLNRL LFPKPTEEFL	
ATCC 21253 psy	1001	1050
NRRL B-11474 pyc	EHRRRFGNTS ALDDREFFYG LVEGRETLIR LPDVRTPLL VRLDAISEPDD	
ATCC 21253 psy	1051	1100
NRRL B-11474 pyc	KGMRNVVANV NGQIRPMRVR DRSVESVTAT AEKADSSNKG HVAAPFAGVV	

FIG.2B



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ATCC 21253 psy	1101		1150
NRRL B-11474 pyc	TVTVAEGDEV KAGDAVAIIE AMKMEATITA SVDGKIDRVV VPAATKVEGG		
		E	
ATCC 21253 psy	1151		1200
NRRL B-11474 pyc	DLIVVVS		

FIG.2C



EFFECT OF VARIOUS SUBSTRATE CONCENTRATIONS ON PYRUVATE CARBOXYLASE
ACTIVITY FROM *C. glutamicum* BF100 (○) AND ATCC 21253 (●).

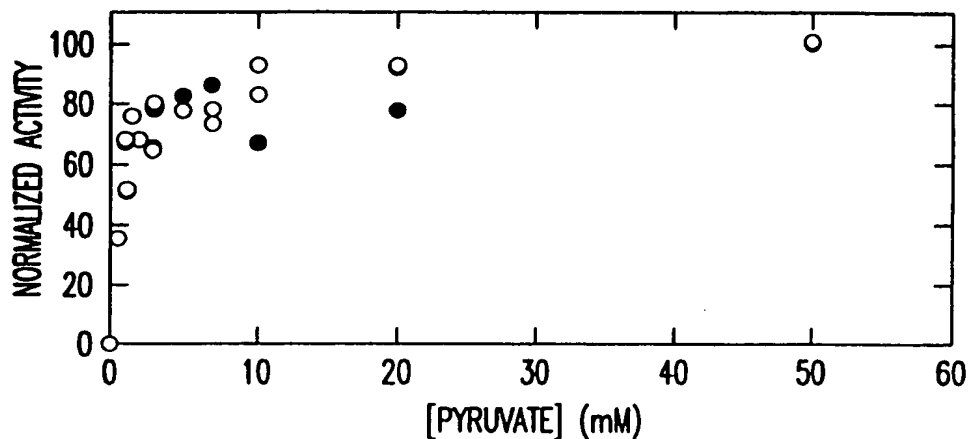


FIG. 3A

EFFECT OF VARIOUS SUBSTRATE CONCENTRATIONS ON PYRUVATE CARBOXYLASE
ACTIVITY FROM *C. glutamicum* BF100 (○) AND ATCC 21253 (●).

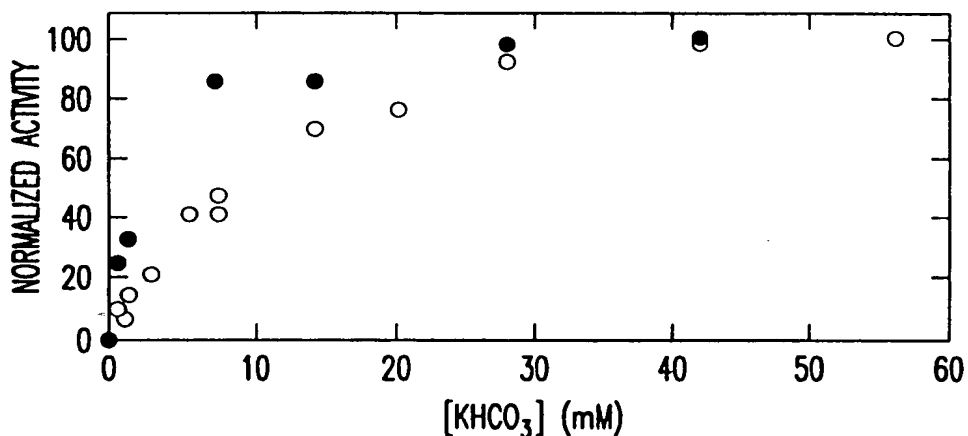


FIG. 3B

EFFECT OF VARIOUS SUBSTRATE CONCENTRATIONS ON PYRUVATE CARBOXYLASE
ACTIVITY FROM *C. glutamicum* BF100 (○) AND ATCC 21253 (●).

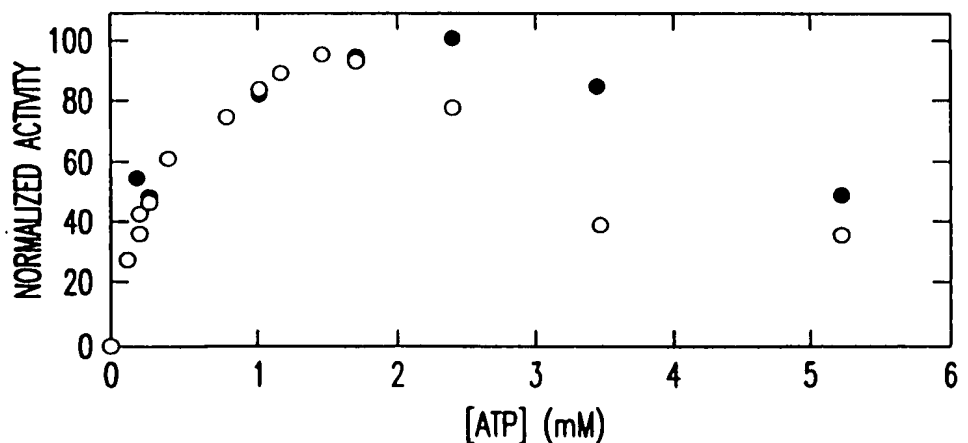


FIG. 3C

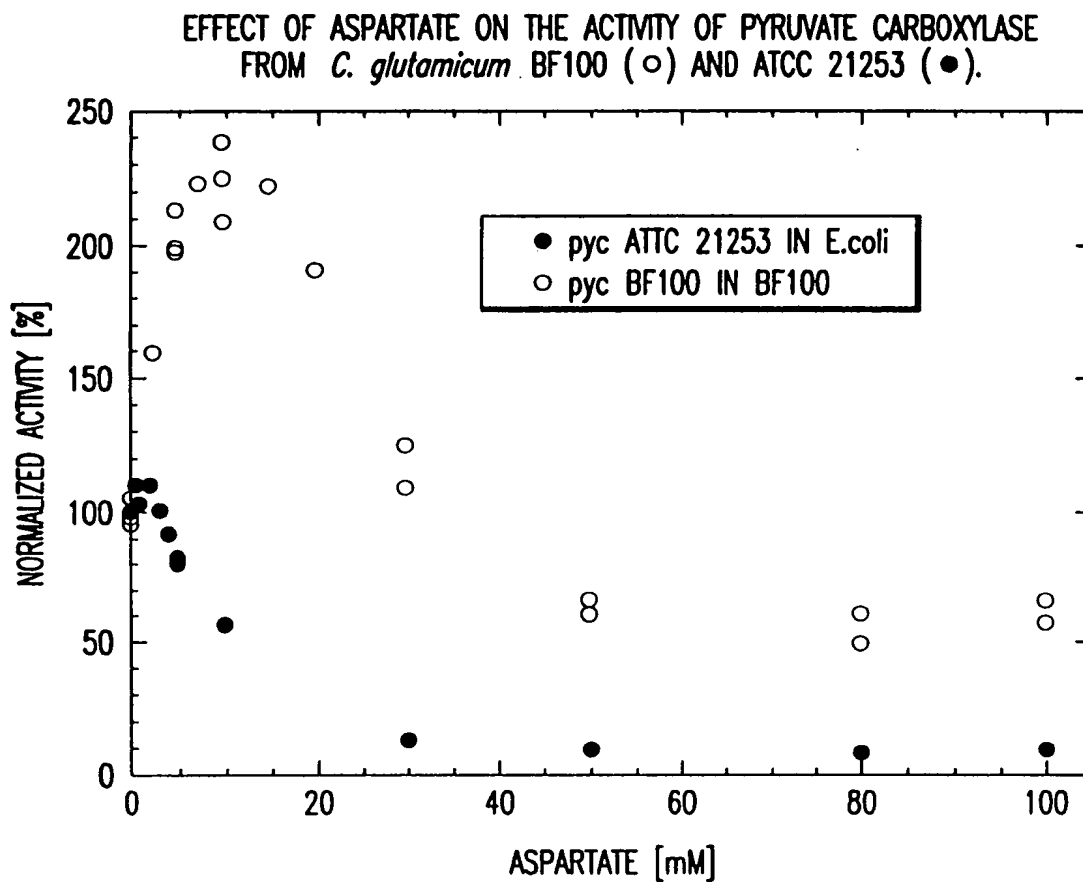


FIG. 4

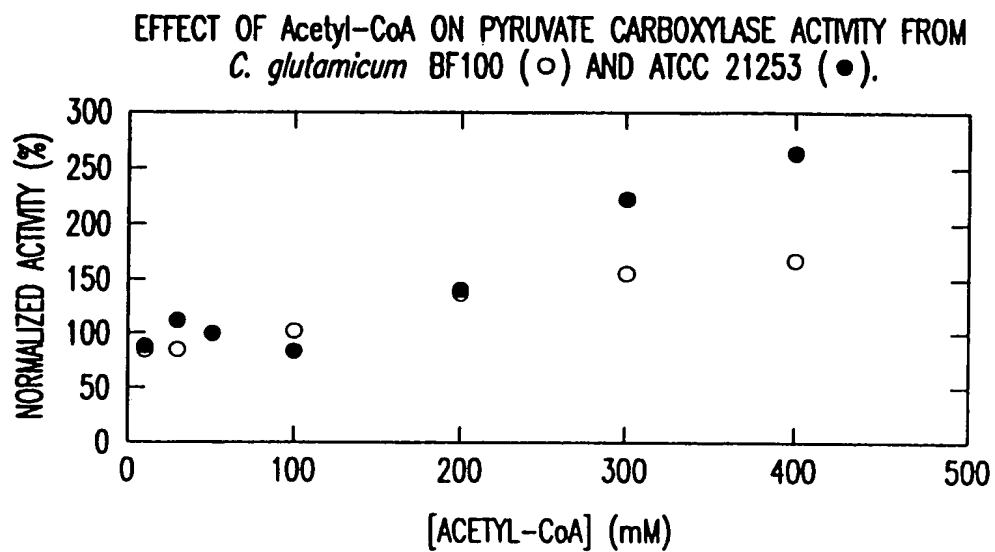
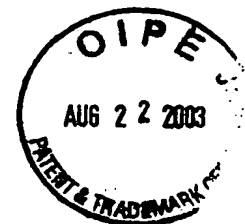


FIG. 5



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Annotated Sheet Showing Changes

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ATCC 21253 psy
NRRL B-11474 pyc

ATCC 21253 psy
NRRL B-11474 pyc

1101 1150
TVTVAEGDEV KAGDAVAIIE AMKMEATITA SVDGKIDRVV VPAATKVEGG
X E

1151 1200
DLIVVVS

FIG.2C

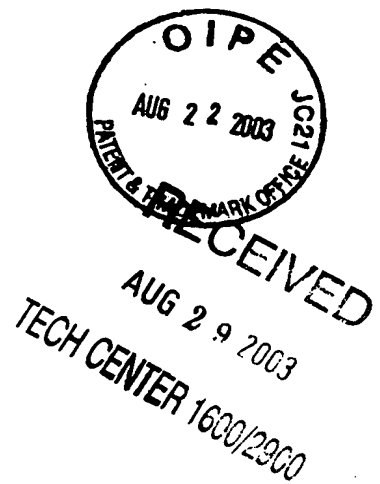


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1600/12030

GTGACTGCTATCACCTTGGCGGTCTCTTGTGAAAGGAATAATTACTCTAGTGTGCTGACTCACACATCTTC
AACGCTTCCAGCATTCAAAAAGATCTTGGTAGCAAACCGCGCGAAATCGCGGTCCGTGCTTTCCGTGCAG
CACTCGAAACCGGTGCAGCCACGGTAGCTATTTACCCCGTGAAGATCGGGGATCATTCCACCGCTCTTTT
GCTTCTGAAGCTGTCCGATTGGTACTGAAGGCTCACCAGTCAAGGCGTACCTGGACATCGATGAAATTAT
CGGTGCAGCTAAAAAAGTTAAAGCAGATGCTATTTACCCGGGATATGGCTTCCTGTCTGAAAATGCTGAGC
TTGCCCGCGAGTGCAGCGAAACGGCATTACTTTTATTGGCCCAACCCAGAGGTTCTTGATCTCAGCGT
GATAAGTCTCGTGCGGTAAACCGCCGCGAAGAAGGCTGGTCTGCCAGTTTTGGCGGAATCCACCCCGAGCAA
AAACATCGATGACATCGTTAAAAGCGCTGAAGGCCAGACTTACCCCATCTTTGTAAAGGCAGTTGCCGCGG
GTGGCGGACGCGGTATGCGCTTTGTTTCTTCACTGATGAGCTCCGCAAATTGGCAACAGAAGCATCTCGT
GAAGCTGAAGCGGCATTGCGCGACGGTTCGGTATATGTCGAACGTGCTGTGATTAACCCCGAGCACATTGA
AGTGCAGATCCTTGGCGATCGCACTGGAGAAGTTGTACACCTTTATGAACGTGACTGCTCACTGCAGCGTC
GTCACCAAAAAGTTGTCGAAATTGCGCCAGCACAGCATTGGATCCAGAAGTGGTGTATGCGATTGTGCG
GATGCAGTAAAGTTCTGCCGCTCCATTGGTTACCAGGGCGCGGGAACCGTGGAAATCTTGGTCGATGAAAA
GGGCAACCACGTTTTTCATCGAAATGAACCCACGTATCCAGGTTGAGCACACCGTGAAGAAAGTCACCG
AGGTGGACCTGGTGAAGGCGCAGATGCGCTTGGCTGCTGGTGAACCTTGAAGGAATTGGGTCTGACCCAA
GATAAGATCAAGACCCACGGTGCAGCACTGCAGTGCCGCATCACCACGGAAGATCCAAACAACGGCTTCG
CCCAGATACCGGAACATATCACCGCTACCGCTCACCAGGCGAGCTGGCGTTCTGTTGACGGTGCAGCTC
AGCTCGGTGGCGAAATCACCGCACACTTTGACTCCATGCTGGTGAAAATGACCTGCCGTGGTTCGACTTT
GAAACTGCTGTTGCTCGTGACAGCGCGCTTGGCTGAGTTACCGTGTCTGGTGTGCAACCAACATTGG
TTTCTTGGCTGCGTTGCTGCGGGAAGAGGACTTCACTTCCAAGCGCATCGCCACCGGATTTATCGGCGATC
ACCCACACCTCCTTCAGGCTCCACCTGCGGATGATGAGCAGGACGCATCCTGGATTACTTGGCAGATGTC
ACCGTGAACAAGCCTCATGGTGTGCGTCCAAAGGATGTTGCAGCACCATCGATAAGCTGCCCAACATCAA
GGATCTGCCACTGCCACGCGGTTCCCGTGACCGCTGAAGCAGCTTGGCCAGCCGCGTTTGTCTGTGATC
TCCGTGAGCAGGACGCACTGGCAGTTACTGATACCACCTTCCGCGATGCACACCAGTCTTTGCTTGCAGC
CGAGTCCGCTCATTGCACTGAAGCCTGCGGCAGAGGCGCTCGCAAAGCTGACTCCTGAGCTTTTGTCCGT
GGAGGCCTGGGGCGGCGGACCTACGATGTGGCGATGCGTTTCTCTTTGAGGATCCGTGGGACAGGCTCG
ACGAGCTGCGCGAGGCGATGCCGAATGTAACATTAGATGCTGCTTCCGCGCCGCAACACCGTGGGATAC
ACCCCGTACCCAGACTCCGTCTGCGCGCGCTTTGTTAAGGAAGCTGCCAGCTCCGGCGTGGACATCTTCCG
CATCTTCGACGCGCTTAACGACGTCTCCAGATGCGTCCAGCAATCGACGAGTCTTGGAGACCAACACCG
CGGTAGCCGAGGTGGCTATGGCTTATTCTGGTGATCTCTCTGATCCAAATGAAAAGCTCTACACCCTGGAT
TACTACCTAAAGATGGCAGAGGAGATCGTCAAGTCTGGCGCTCACATTCTGGCCATTAAGGATATGGCTGG
TCTGCTTCGCCCAGCTGCGGTAACCAAGCTGGTACCGCACTGCGCCGTGAATTCGATCTGCCAGTGCACG
TGCACACCCACGACACTGCGGGTGGCCAGTTGGCTACCTACTTTGCTGCAGCTCAAGCTGGTGCAGATGCT
GTTGACGGTGCTTCCGCACTGTCTGGCACCACTCCAGCCATCCCTGTCTGCCATTGTTGCTGCATT
CGCGCACACCCGTGCGATACCGGTTTGAAGCTCGAGGCTGTTTCTGACCTCGAGCCGTAAGGAAAGCTG
TGCGCGGACTGTACCTGCCATTTGAGTCTGGAACCCAGGCCAACCGGTGCGCTTACCGCCACGAAATC
CCAGGCGGACAGTTGTCCAACCTGCGTGCACAGGCCACCGCACTGGGCTTGTGATCGCTTCGAGCTCAT
CGAAGACAACCTACGAGCCGTTAATGAGATGCTGGGACGCCAACCAAGGTACCCCATCTCCAAGGTTG
TTGGCGACCTCGCACTCCACCTGGTTGGTGGGCTGATGATCCAGCAGACTTTGCTGCAGACCCACAAAAG
TACGACATCCAGACTCTGTATCGCTTCTGCGCGGCGAGCTTGGTAACCTCCAGGTGGCTGGCCAGA
ACCACTGCGCACCCGCGCACTGGAAGGCCGCTCCGAAGGCAAGGCACCTCTGACGGAAGTTCTGAGGAAG
AGCAGGCGCACCTCGACGCTGATGATTCCAAGGAACGTCGAACAGCCTCAACCGCCTGCTGTTCCCGAAG
CCAACCGAAGAGTTCTCGAGCACCGTCCGCGCTTCGGAACACCTCTGCGCTGGATGATCGTGAATCTT
CTACGGAAGTGGTGGAGGCGCGAGACTTTGATCCGCTGCCAGATGTGCGCACCCCACTGCTTGTTCGCC
TGGATGCGATCTCTGAGCCAGACGATAAGGGTATGCGCAATGTTGTGGCCAACGTCAACGGCCAGATCCGC
CCAATGCGTGTGCGTGACCGCTCCGTTGAGTCTGTACCGCAACCGCAGAAAAGGCAGATTCTCCAACAA
GGGCCATGTTGCTGCACCATTCGCTGGTGTGTCACTGTGACTGTTGCTGAAGGTGATGAGGTCAAGGCTG
GAGATGCAGTCGCAATCATCGAGGCTATGAAGATGGAAGCAACAATCACTGCTTCTGTTGACGGCAAGATT
GAACGCGTTGTGGTTCCTGCTGCAACGAAGGTGGAAGGTGGCGACTTGATCGTCTGCTGTTTCTTAA

FIG.3A

DELETE



MTAITLGGLLLKGIITLVSTHTSSTLPFAFKKILVANRGEIAVRAFRAALETGAATVAIYPREDRGSFHRSFASEAVRIG
TEGSPVKAYLDIDEIIGAACKVKADAIYPGYGFLSENAQLARECAENGITFIGPTPEVLDTGDKSRAVTAACKAGLPV
LAESTPSKNIDDIVKSAEGQTYPIFVKAVAGGGGRGMRFVSSPDELRLKATEASREAEAAFGDGSVYVERAVINPQHIE
VQILGDRTGEVVHLYERDCSLQRRHQKVVEIAPAQHLDPELRDRICADAVKFCSRIGYQGAGTVEFLVDEKGNHVF IEM
NPRIQVEHTVTEEVTEVDLVKAQMRLAAGATLKEGLTQDKIKTHGAALQCRITTEDPNNGFRPDTGTITAYRSPGGAG
VRLDGAAQLGGEITAHFDSMLVKMTCRGSDFETAVARAQRALAEFTVSGVATNIGFLRALLREEDFTSKRIATGFIGDH
PHLLQAPPADDEQGRILDYLADVTVNKPHGVRPKDVAAPIDKLPNIKDLPLPRGSRDRLKQLGPAAFARDLREQDALAV
TDTTFRDAHQSLLATRVRSFALKPAAEAVAKLTPELLSVEAWGGATYDVAMRFLFEDPWDRLDELREAMPNVNIQMLLR
GRNTVGYPYPDSVCRAFVKEAASSGVDIFRIFDALNDVSQMRPAIDAVLETNTAVA EVAMAYSGDLSDPNEKLYTLDY
YLKMAEEIVKSGAHILA IKDMAGLLRPAAVTKLVTALRREFDLPVHVHHTDTAGGQLATYFAAAQAGADA VD GASAPLS
GTTSPSLSAIVAAFAHTRRDTGLSLEAVSDLEPYWEAVRGLYLPFESGTPGPTGRVYRHEIPGGQLSNLRAQATALGL
ADRFELIEDNYAAVNEMLGRPTKVTPSSKVVGDLALHLVGAGVDPADFAADPQKYDIPDSVIAFLRGELGNPPGGWPEP
LRTRALEGRSEGKAPLTEVPEEEQAHLDDADDSKERRNSLNRLLPKPTEEFLEHRRRFGNTSALDDREFFYGLVEGRET
LIRLPDVRTPLLVRDLAISEPDDKGMNRNVVANVNGQIRPMRVRDRSVESVTATAEKADSSNKGHVAAPFAGVVTVAE
GDEVKAGDAVAII EAMKMEATITASVDGKIERVVVPAATKVEGGDLIVVS

FIG.3B

DELETE